

Summary of Significant Changes to EIS

In response to many of the written and oral comments received regarding the draft EIS, and as result of additional analysis by Commission staff, significant changes to the draft EIS have been made.

The final EIS is approximately 200 pages longer (including appendices) than the draft EIS. In addition, Chapters 3 and 4 in the draft EIS are switched in this final EIS.

The following pages summarize some of the more significant changes that have been made to the EIS. The information is presented chapter by chapter. The information shown in bold, i.e. **Ownership and operation of the project**, refer to section headings or subheadings within the text. These headings and subheadings are identified so that the reader can find the page number on which the changes were made by referring to the Table of Contents.

There were many changes made that are not listed in the summaries below. The overwhelming majority of those changes were made to improve the readability of the text, correct errors, and to improve the consistency of formatting throughout the EIS.

Chapter 1: Background

Ownership and the operation of the project: This section was revised to reflect WPSC ownership of the entire Wisconsin portion of the project, with MP retaining an option to purchase ownership of the portion between Exeland and the Wisconsin/Minnesota border.

Environmental impact assessment fees: This section was revised to provide further clarification of the impact fees established in 1999 Wisconsin Act 9. The discussion clarifies that promulgation of the rules to establish the fees is the jurisdiction of the DOA.

The role of the Commission: This is a new section explaining the Commission's role in determining whether the proposed project is constructed. This section includes a summary of the statutory requirements that must be met before the Commission may issue a CPCN for this project.

Chapter 2: Need for Electric System Improvements in Wisconsin

Recent history of reliability and electricity shortfalls: This section has been updated with new information regarding the function of the existing transmission system during summer

2000. Data regarding peak day operating reserves during 1995-1999 has been added within this section.

Population and employment growth translate into electricity use increases and problems: Updated data regarding peak demand in Wisconsin for 1999 has been provided.

Electricity supply adequacy: The section has been expanded to provide a more in-depth explanation of the implications of increased use of the existing transmission system on the potential for widespread blackouts.

Loss of load expectation (LOLE) analysis: This section has been enhanced to provide a better explanation of the reliability implications of an 18 percent reserve margin. In particular, the section provides further explanation of how utilities work to ensure adequate reserves on a system-wide basis, in addition to ensuring adequate reserve levels for each individual system.

Common-mode problems in non-nuclear units: This is a new section that discusses the potential for common-mode problems in non-nuclear (i.e. coal plants) generating plants, and the implications of such common-mode problems on the reliability of the existing electrical system.

Local area problems: This section is new. It provides information regarding near-term plans to meet demand in northwestern Wisconsin, and potential for future use of the Arrowhead-Weston Transmission Project to enhance reliability in northwestern Wisconsin.

Continued growth in firm and non-firm electricity transactions: This section was modified to provide an assessment of summer 1999 electric supply and demand conditions, from both a statewide, and an eastern Wisconsin utilities (EWU) perspective.

Increasing congestion on the transmission system limiting economic purchases: This section was updated to provide additional information regarding more recent MAIN assessments of first-contingency total transfer capability (FCTTC) for 1999-2000.

Increased transfer capability may decrease purchased power prices: The information provided has been updated with more recent MAIN electricity prices.

Effects of Midwest ISO on transmission use and congestion: This is a new section explaining potential impacts of Midwest ISO transmission tariffs on regional electricity prices and operation of the regional transmission system.

New transmission company: This is a new section explaining potential impacts of the American Transmission Company, LLC. (ATCo), which is forming as a result of legislative changes in 1999 Wisconsin Act 9, on the operation and control of the transmission system in Wisconsin.

Chapter 3: Alternative High-Voltage Transmission System Improvements in Wisconsin

Note: Chapter 3 in the final EIS was presented as Chapter 4 in the draft EIS. The decision to switch the order of Chapters 3 and 4 was made to provide for a more logical progression of the discussion of issues within the EIS.

Engineering Analysis:

- **WIRE study:** This section was expanded to add information regarding relatively minor transmission improvement projects that were analyzed as integral components of the WIRE study analysis of the larger EHV system alternatives.
- **Summary of transfer capability performance of alternatives:** This is a new narrative summary of tables that present the results of the engineering performance for each of the EHV system alternatives analyzed in the WIRE study.
- **Ability to provide local area support:** This is a new section that discusses the potential of the Arrowhead-Weston Transmission Project to enhance local area support in the future.
- **Geographic diversity:** This section was expanded significantly. The new information is based on an analysis of historical data from some of the utilities in Wisconsin regarding causes of outages of the existing transmission system.
- **Validity of WIRE study assumptions:** This is another significantly expanded section. This section addresses some of the key assumptions used in the WIRE study including assumptions related to: the Chisago-Apple River transmission line, the Plano-Plano Tap line, and additional projects.

Environmental Analysis:

- **Agricultural:** This is a new section that discusses a system level analysis of potential agricultural impacts of the different EHV system alternatives analyzed within the WIRE study.
- **Social Issues:** This is a new section that discusses a system level analysis of potential social impacts (i.e. aesthetics, restrictions on land use) of the different EHV system alternatives analyzed within the WIRE study.

Chapter 4: Alternative System Improvements in Wisconsin

Note: Chapter 4 in the final EIS was presented as Chapter 3 in the draft EIS. The decision to switch the order of Chapters 3 and 4 was made to provide for a more logical progression of the discussion of issues within the EIS. It is also important to note that the order of the topics

presented within the new Chapter 4 has also been changed significantly from the order of discussion within the old Chapter 3.

No build alternative: This is a new section which describes the implications of continuing to rely upon the existing transmission system and existing generation sources, with no further expansion.

Merchant power plants as an Arrowhead-Weston alternative: This section was updated to provide information regarding recently announced power plant proposals by IPPs.

Reliance on rate-based power plants: This section provides information regarding recent announcements for utility (or utility affiliate) owned power plants.

Changes occurring in the regulation of energy efficiency: This section was expanded to provide more information regarding the DOA's regulation of energy efficiency programs and budgets.

Staff analysis of energy efficiency: This is a new section discussing Commission staff's analysis of energy efficiency as a potential offset to the need for additional generation or transmission capacity.

Market-based curtailable load programs: This is a new section discussing the potential for new curtailable load programs to help offset electricity demand, particularly during peak demand periods.

Cost calculations for 1,560 MW of reliability enhancements using conventional generation sources: This section includes significant modifications to many of the subsections. Some of the modifications include:

- The cost comparisons now include a comparison of the Arrowhead-Weston project to both combustion turbines and combined cycle generation. The draft EIS used only combined cycle generation in the comparisons.
- Comparisons of generation to the Arrowhead-Weston project were made using two different purchased power price scenarios: the first scenario uses average purchased power prices of Wisconsin's five largest electric utilities during 1999; the second uses Bloomberg spot price data from MAIN.
- The cost comparison analyses were updated to reflect anticipated effects of a MISO tariff for transmission service.
- The cost comparison analyses were updated to reflect maintenance costs.
- The cost comparison analyses reflect a higher cost estimate for the Arrowhead-Weston project. The cost increases reflect the "additional" projects that were assumed in the WIRE studymaking Arrowhead-Weston as effective as intended.

- The cost comparison analyses were updated for new analysis of the energy credits associated with lower line losses that could result if the Arrowhead-Weston project is constructed.

Sensitivity to MAPP purchased power prices: This section provides a sensitivity analysis of the cost comparison analyses using MAPP purchased power prices rather than using purchased power prices from MAIN.

Sensitivity to expected 2010 purchased power prices: This section provides a sensitivity analysis of the cost comparison analyses to forecasted purchased power prices from both MAIN and MAPP based on data from Resource Data International, Inc.

Sensitivity to current year 2000 economic considerations: This section provides a sensitivity analysis of the cost comparison analyses from more recent information. In particular, the sensitivity analysis considers generation construction cost information and updated fuel cost information.

Sensitivity to cost overruns for the Arrowhead-Weston project: This section provides a sensitivity analysis of the cost comparison analyses for each 10 percent cost overrun increment on the Arrowhead-Weston project.

Cost calculations for 1,560 MW of reliability enhancement using renewable generation sources: This section presents similar cost comparisons as those used for conventional generation, using wind and whole-tree generation.

Cost comparison between installing new combustion turbines and the Arrowhead-Weston Transmission Project using the applicants' pure capacity reliability perspective: This section includes updated analysis using the most recent Arrowhead-Weston cost estimates and the revised energy credit analysis associated with line loss savings.

Assessment of future electric supply from the MAIN and MAPP regions: This is a new section that provides an analysis of the anticipated availability of generation capacity in the MAIN and MAPP regions.

Analysis of an integrated alternative: This is an entirely new section that is fairly extensive.

Import capability improvements achievable without a major new EHV line

This new section discusses the potential for more modest transmission construction by the utilities, including other currently planned projects, to alleviate or reduce the need for the Arrowhead-Weston Transmission Project. This analysis is based primarily on SEA data and AP-8. Subsections to this analysis include: Transmission analysis inputs and methodology, Thermal limits, Voltage and dynamic stability limits, Arpin phase angle problem, and Other operating guides.

Environmental effects of the alternative system improvements: The environmental discussion of alternative system improvements has been moved around within the new Chapter 4 so that all of the environmental analysis is in one section at the end of the chapter. Significant new or revised subsections include:

- Impacts related to combined cycle and simple-cycle combustion turbines. This subsection was updated to include information about the impacts of combustion turbine generation.
- Environmental effects of renewable generation alternatives. This new section includes information to specifically address the environmental impacts of wind power and biomass generation alternatives.
- Environmental effects of fuel cells and micro turbines. This new section addresses the environmental effect of various distributed generation technologies.

Long-term employment effect of alternative system improvements: This is a new section that addresses employment effects of various generation and transmission system alternatives.

Environmental review of the Lower-Voltage Transmission reinforcement alternative: This is a new section providing a summary of the potential environmental risks associated with planned transmission reinforcements identified by the utilities in the SEA and AP-8.

Chapter 5: General Environmental Considerations for the Transmission Line Projects

Landowners' rights: This is a new section that summarizes landowners' rights under Wisconsin statutes with regard to construction of electric transmission lines over 100 kV.

Conservation Reserve Program lands: This is a new section that explains the CRP program and potential complications with constructing transmission lines through CRP lands.

Forest resources: This section includes new and expanded discussion of various potential impacts related to the construction of electric transmission lines through forests. This section includes new subsections such as: Forest valuation, Sustainable forest management, Forest fragmentation and neotropical migrant birds, and Sugar bush operations.

Electric and magnetic fields: The majority of the information regarding EMF has been moved to Appendix D. The information in Appendix D includes additional information regarding EMF and pacemakers, and EMF and radon.

Property values: This section has been expanded to provide additional information regarding studies on the impact of electric transmission lines on property values.

Safety: This section has been expanded to include discussion of Safety standards, Contact with transmission lines, Induced voltages, and Lightning.

Stray voltage and dairy livestock: This section has been expanded to further explain that stray voltage is primarily an issue associated with the electric distribution system, rather than the electric transmission system.

Water resources: This new section combines the former River and streams sections and the Wetland section into one major section. Expanded discussions include the following subsections:

- Permitting process for river and stream crossings, including information regarding DNR, COE and NPS approval processes.
- Impacts on wetlands, which provides additional information related to “susceptible” wetlands.
- Permitting process for wetlands, which provides information regarding DNR and COE approval processes.
- Wetlands Reserve Program lands, which explains the USDA program for restoring, protecting, or enhancing wetlands.

Chapter 6: General Engineering and Environmental Aspects of the Arrowhead-Weston Project

Corridor sharing issues for the proposed project: This is a new section that clarifies the concept and types of corridor sharing possible for the Arrowhead-Weston project. It also discusses the potential for, and concerns related to allowing the ROW of the proposed project to overlap existing infrastructure ROW.

Tripoli 4 Route: This section presents the ROW requirement data tables for the new Tripoli 4 Route.

Owen 4 Route: This section presents the ROW requirement data tables for the new Owen 4 Route.

Transmission line construction practices and mitigation: This is a new section discussing anticipated construction methods and environmental mitigation measures that may be used during construction of the proposed project. The information primarily targets sensitive environmental areas. The information is based upon information provided by the applicants and on information obtained from WEPCO for a transmission line project it recently constructed in the Upper Peninsula of Michigan. Volume 2 includes several new photographs depicting construction methods and environmental mitigation measures used in the Upper Peninsula project. [Figures Vol. 2-35 through 2-46]

Noise: This section has been rewritten to provide more specific information.

Fiber optics and regeneration stations: This section has been expanded significantly to provide clarification of the applicants' plans for installing fiber optic shield wires as part of the project.

Chapter 7: Environmental Analysis of the Oliver to Exeland Routes - Existing Conditions and Potential Impacts

Oliver Route 1 – Accessibility: This section has been revised to include reference to a wetlands discussion in Chapter 5. This section also includes additional detail on accessibility to the Nemadji River and Crawford Creek.

Namekagon River: This section includes new footprint and cross-section schematics of the Namekagon River crossing if the existing 161 kV line is underground and the new 345 kV line is overhead. In addition, two new photo simulations were added in Volume 2, [Figures Vol. 2-47 and 2-48], as well as a photo simulation of a transition station [Figure Vol. 2-29].

Oliver Routes 1, 2, & 3 - Sensitive wetlands areas: The discussion of each route alternative includes a new discussion of sensitive wetlands.

Oliver Routes 1, 2, & 3 - Forest fragmentation impact: The discussion of each route alternative includes an expanded discussion of forest fragmentation. In particular, the information has been expanded to discuss forest fragmentation impacts related to blocks of forest between 200 and 1000 acres in size.

Oliver Routes 1, 2, & 3 - Industrial forest: The discussion of each route alternative includes a new section identifying industrial forests that may be impacted by the construction of the proposed project.

Oliver Routes 1, 2, & 3 – Wildlife: The discussion of each route alternative includes a new section that discusses the potential impact of construction on wildlife, in particular the Canada Lynx. Additional route-specific information regarding the impact of construction on Timber Wolf habitat is discussed.

Oliver Route 1 - Recreation trails affected: This section includes an expanded discussion of the National Scenic Trails system.

Oliver Route 2 - Other county, state, and federal land: This section includes a new paragraph that discusses the potential impacts of routing the project through property that is subject to a Farm Service Agency Debt Cancellation Conservation Contract.

Oliver Route 3 - La Courte Oreilles Reservation: This is a new section that discusses potential difficulties of sighting transmission lines across the reservation.

Chapter 8: Environmental Analysis of the Exeland - Tripoli - Weston Routes - Existing Conditions and Potential Impacts

Note: The final EIS includes analysis of an additional route (Tripoli 4 Route) which was not analyzed within the draft EIS. The new Tripoli 4 Route does not include any new route segment, but rather, is a new configuration of certain sections of the previously defined routes. Chapter 8 provides information related to the Tripoli 4 Route in a similar manner to that used for the other three route alternatives in the Tripoli Sector.

Tripoli 1, 2, 3 & 4 Routes - Nationwide Rivers Inventory: Each route alternative section includes a new section identifying Nationwide Rivers Inventory rivers crossed.

Tripoli 1, 2, 3 & 4 Routes - Accessibility: Each route alternative section includes a discussion of problems associated with accessing certain areas of the proposed route.

Tripoli 1, 2, 3 & 4 Routes - Sensitive wetland areas: Each route alternative includes a new discussion of sensitive wetlands.

Tripoli 1, 2, 3 & 4 Routes - Special wetland resources: Each route alternative includes a new discussion of wetlands associated with Outstanding or Exceptional Resource Waters and/or trout streams.

Tripoli 1, 2, 3 & 4 Routes - Industrial forests: Each route alternative includes a new section identifying industrial forests that may be impacted by the construction of the proposed project.

Tripoli 1, 2, 3 & 4 Routes - Forest fragmentation impact: Each route alternative includes an expanded discussion of forest fragmentation. In particular, the information has been expanded to discuss forest fragmentation impacts related to blocks of forest between 200– and 1,000 acres in size.

Tripoli 1, 2, 3 & 4 Routes – Wildlife: A new table of federal or state listed threatened or endangered species was added to the discussion of each route alternative.

Tripoli 1, 2, 3 & 4 Routes – Agricultural: This section primarily references the reader back to the Chapter 5 discussion of construction and long-term impacts on agricultural land.

Tripoli 1, 2, 3, & 4 Routes - Special areas: This section includes a new discussion of the Knox Creek Heritage Center. Tripoli 2, & 3 Routes include a new discussion of Timm's Hill.

Tripoli 1, 2, 3, & 4 Routes – Forests: This section was expanded for a new discussion of maple sugar bush impact.

Chapter 9: Environmental Analysis of the Exeland-Owen-Weston Routes - Existing Conditions and Potential Impacts

Note: The final EIS includes the analysis of an additional route (Owen 4 Route) which was not analyzed within the draft EIS. The new Owen 4 Route does not include any new route segment, but rather, is a new configuration of certain sections of the previously defined routes. Chapter 9 provides information related to the Owen 4 Route in a similar manner to that used for the other three route alternatives in the Owen Sector.

Owen 1, 2, 3, and 4 Routes - Nationwide Rivers Inventory: A new section was added identifying the Nationwide Rivers Inventory rivers crossed.

Owen 1, 2, 3, and 4 Routes – Accessibility: Each route alternative section includes a discussion of problems associated with accessing certain areas of the proposed route.

Owen 1, 2, 3, and 4 Routes - Sensitive wetlandtypes: Each route alternative includes a new discussion of sensitive wetlands.

Owen 1, 2, 3, and 4 Routes - Special Wetland Resources: This section discusses wetlands associated with Outstanding or Exceptional Resource Waters or trout streams.

Owen 1, 2, 3, and 4 Routes - Industrial Forests: Each route alternative includes a new section identifying industrial forests that may be impacted by the construction of the proposed project.

Owen 1, 2, 3, and 4 Routes - Forest fragmentation: Each route alternative includes an expanded discussion of forest fragmentation. In particular, the information has been expanded to discuss forest fragmentation impacts related to blocks of forest between 200 and 1,000 acres in size.

Owen 1, 2, 3, and 4 Routes – Wildlife: A new table of federal or state listed threatened or endangered species was added to the discussion of each route alternative. The Owen 2 Route Wildlife section includes a discussion of greater prairie chicken booming grounds near the proposed route.

Owen 1, 2, 3, and 4 Routes - Agricultural use and impacts: This section primarily references the reader back to the Chapter 5 discussion of construction and long-term impacts on agricultural land.

North, Central, South, and Cross Country Routes - Socioeconomic impacts: This section was modified to add a discussion of tourism impacts.

Centraland Railroad Routes - Threatened and endangered species: Each of the Route discussion include information, in a table format, regarding threatened and endangered species.

Cross-Country Route - Wetlands: This section includes new information regarding the impact of the proposed route on 18.5 acres of wetland.

Chapter 12: Comparative Summaries and an Overview of the Choices and Decisions

Chapter 12 provides summaries of information for each of the Route Sectors. The most significant change in Chapter 12 reflects the two new routes, Tripoli 4 Route and Owen 4 Route. The other major change to Chapter 12 is to summarize critical environmental concerns and permitting issues for each Route Sector.

